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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,455	07/07/2003	Hwa-Seok Oh	8021-159 (SS-16950-US)	7509
22150	7590	12/04/2006	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			SUN, SCOTT C	
			ART UNIT	PAPER NUMBER
			2182	

DATE MAILED: 12/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/614,455		OH, HWA-SEOK	
	<b>Examiner</b>		<b>Art Unit</b>	
	Scott Sun		2182	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 6-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/9/2006 has been entered.

### *Response to Arguments*

2. Applicant's arguments filed 8/9/2006 have been fully considered but they are not persuasive. Applicant's arguments are summarized as:
- a. Regarding claims 4 and 5, prior art of record does not teach the limitation "excludes times of the data frames".
  - b. Regarding claim 12, prior art of record does not teach a "type field".
  - c. Regarding claim 1, prior art of record does not teach "counting a number of data frames if a time delay has not passed" (emphasis added).
  - d. Regarding claim 9, prior art of record does not teach "determining whether the protocol field is identical to a predetermined protocol field if the number of received data frames is not equal to N" (emphasis added).

e. Regarding claim 11, the scope is different than that of claim 12. Therefore the rejection of claim 12 does not apply.

f. Regarding claims 15, 18, 20, 22, and 25, prior art of record does not teach a "time delay determining circuit".

3. In response to argument 'a', examiner notes that prior art Connor teaches that "the first threshold corresponds to a time period greater than a minimum inter-frame gap (IFG) but that is less than the sum of a minimum IFG and a packet time" (emphasis added). Connor does not teach that the first threshold is equivalent to the sum of a minimum IFG and a packet time. Examiner notes that Connor is merely teaching a way to determine an estimated inter-frame gap (IFG), or packet time. Therefore, this delay is still a gap between frames (greater than the minimum gap) but does not include the times of the data frames. Furthermore, examiner notes that applicant did not point out where in the disclosure the added limitation can be found, as negative limitations require explicit recitation in the specification.

4. In response to argument 'b', examiner notes that an "end of data flag" would determine if a particular frame is a last packet (a type of packet), and therefore the flag would qualify as the type field. Applicant argues that it was well known in the art at the time that a type field corresponds to the protocol field, but merely states this without any evidence. Even if such evidence are present (i.e. in the specification), it is noted that the features upon which applicant relies are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the

specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Even if assuming a type field is the protocol field and an "end of data flag" does not qualify as a type field, examiner notes claims 12 and 22 recite both a type field and a protocol field, suggesting that the two are not equivalent. This is further illustrated in figure 11. It is then unclear what is meant by applicant's argument, as it appears to contradict the disclosure of the invention.

5. In response to arguments 'c' and 'd', examiner notes that the prior art teaches various tests (checking time delay, packet count, protocol, etc) under which interrupts can be asserted. In combining these various tests for generating interrupts, it is then obvious that if one of the tests fails to produce an interrupt, another test is checked. As each of the prior art recite a reason for using these tests as a criteria for asserting an interrupt, this combination of the references is not hindsight.

6. In response to argument 'e', examiner notes that claim 12 contains each and every limitation in claim 11, and while the scopes of the two claims are different, claim 11 is broader in scope, and contains no new limitations that would warrant a new rejection. In any case, the rejection for claim 11 is fully explained below to avoid any ambiguity.

7. In response to argument 'f', examiner notes that Connor clear teaches a "time delay determining circuit", namely the packet timer and the absolute packet timer (figures 2, 4), which is also detailed in the rejection.

Art Unit: 2182

8. Having responded to each of applicant's arguments, examiner notes that prior art of record still provide a valid ground of rejection as follows. Slight changes are made to better clarify the previous rejections. Other new rejections are made in response to the amendments.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 3, 4, 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, examiner finds no recitation in the specification that explicitly states that a second time delay "excludes times of the data frames".

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

Art Unit: 2182

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claim 4 is rejected under 35 U.S.C. 102(e) as being anticipated by Connor (PG Pub # US 2003/0061426).

13. Regarding claim 4, Connor discloses a method (figure 4) of generating interrupts of a network interface card which transceives data, the method comprising:

- a. receiving data frames (step 405, paragraph 28);
- b. determining a packet time delay (packet timer) in response to the received data frames (step 405, 410, paragraph 28);
- c. determining whether the packet time delay has passed, wherein the packet time is a time interval between received data frames and excludes times of the data frames (paragraph 26, The examiner notes that the first packet timer threshold as defined by Connor is greater than minimum inter-frame gap and less than the sum of minimum inter-frame gap and packet time, which is less than the total time required to receive and process each frame. This time period is therefore between received data frames) and generating an interrupt if the packet time delay has passed, or going back to step b if the packet time delay has not passed (step 435);
- d. stopping an operation of determining the packet time delay and transmitting the received data frames (step 430, 435, paragraph 22);
- e. receive a new data frame and going back to step b. (step 405). Further regarding stopping operation, the examiner asserts that by definition of interrupt in the art, normal processing operations are stopped to process the interrupt routine.



***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claim 11 is rejected as being obvious over Connor, in view of Bennett et al (US 6,345,302).

16. Regarding claim 11, Connor discloses a method (figure 4) of generating interrupts of a network interface card which transceives data, the method comprising:

- receiving data frames (step 405, paragraph 28);
- generating an interrupt (step 435);
- stopping operations and transmitting the received data frames (step 430, 435, paragraph 22);

Connor does not disclose explicitly generating an interrupt based on determination of the protocol field. However, Bennett discloses determining whether the protocol field (protocol field) of the received data frames is identical to a predetermined protocol field (TCP, UDP, figure 15); and generating an interrupt if the protocol field is identical to the predetermined protocol field (column 14, lines 25-30); receiving a new data frame and going back to step b (loop back to beginning). Teachings of Connor and



Art Unit: 2182

Bennett are from analogous art of network interfaces, and specifically to packet processing.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's with Bennett's teachings by adding the protocol logic circuitry disclosed by Bennett into the combined system of Connor, Gentry and Satran for the benefit of efficiently operating protocol in a computer network (summary of invention, first paragraph).

17. Claims 12-14 are rejected as being obvious over Connor, in view of Satran et al (PG Pub # US 2002/0029305), Gentry Jr. et al (US 6,467,008), and Bennett et al (US 6,345,302).

18. Regarding claim 12, Connor discloses a method (figure 4) of generating interrupts of a network interface card which transceives data, the method comprising:

- determining a second time delay in response to the received data frames;
- determining whether the second time delay has passed and generating the interrupt if the second time delay has passed;
- stopping operations of determining the second time delay in response to the generated interrupt and transmitting the received data frames;
- stopping operations of determining the first time delay in response to the generated interrupt and transmitting the received data frames; and
- receiving a new data frame and going back to estimating a first time delay (see 102 rejection for claim 4 above for specific teachings and examiner's arguments).

Connor further discloses determining a first time delay (figure 4, absolute timer); determining whether the first time delay has passed and generating an interrupt if the first time delay has passed (figure 4, step 426);

Connor does not teach explicitly counting number of data frames. However, Gentry discloses counting a number of data frames (figure 1, packet counter); and generating an interrupt if the number of received data frames is equal to N (figure 1, packet threshold, element 126, 128, 132; column 10, lines 45-53); Teachings of Gentry and Connor are from analogous art of network interfaces and specifically of interrupt handling.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's invention with Gentry's teachings by adding the packet counting circuits into the network interface in the system disclosed by Connor for the benefit of further reducing number of interrupts without preventing packets from being processed in a timely manner (column 3, lines 6-10)

Connor and Gentry combined does not teach explicitly determining a type field. However, Satran discloses determining whether the type field (last packet flag in the header) of the received data frames is identical to a predetermined type field (flag indicating last packet, paragraph 35, 36, figure 3) and generating an interrupt if the type field is identical to the predetermined type field (paragraph 36, figure 3). Teachings of Connor, Gentry, and Satran are from analogous art of network interfaces, and specifically of interrupt handling.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's and Gentry's teachings as above and further with Satran's teaching by adding circuitry or logic that recognizes a field in the packet header to recognize last packet of transmissions into the combined system of Connor and Gentry for the benefit of minimizing interrupts in determining when a transaction using RDMA has completed (paragraph 13).

Connor, Gentry, and Satran combined does not disclose explicitly determining the protocol field. However, Bennett discloses determining whether the protocol field (protocol field) of the received data frames is identical to a predetermined protocol field (TCP, UDP, figure 15); and generating an interrupt if the protocol field is identical to the predetermined protocol field (column 14, lines 25-30). Teachings of Connor, Gentry, Satran, and Bennett are from analogous art of network interfaces, and specifically to packet processing.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's, Gentry's and Satran's teachings as above and further with Bennett's teachings by adding the protocol logic circuitry disclosed by Bennett into the combined system of Connor, Gentry and Satran for the benefit of efficiently operating protocol in a computer network (summary of invention, first paragraph).

The examiner also makes the following assertions regarding rejection of the above claim. A person of ordinary skill in the art in light of the combination of Connor, Gentry, Satran and Bennet's teachings can readily envision an order of checking each

of the tests, such as the order disclosed by the applicant (first delay, then count of frames, then second delay, then type, and finally protocol).

19. Regarding claim 13, Connor, Gentry, Satran, and Bennett discloses the method of claim 12, wherein Connor further discloses the first time delay starts from when a first data frame is received (figure 4, step 415).

20. Regarding claim 14, Connor, Gentry, Satran, and Bennett discloses the method of claim 12, wherein Connor further discloses the second time delay is a time interval between the received data frames (paragraph 26, figure 6).

21. The examiner asserts that any subset of Gentry, Satran, and Bennet's teachings can also be combined with Connor's teachings for the reasons given in rejection of claim 12. The following rejections are made in light of this assertion.

22. Claims 1-3 are rejected as being obvious over Connor, in view of Gentry. These claims contain a subset of elements found in claim 12 and are rejected using the same arguments as above.

23. Claims 6-7 are rejected as being obvious over Connor in view of Gentry and Satran. These claims contain a subset of elements found in claim 12 and are rejected using the same arguments as above.

24. Claim 8 is rejected as being obvious over Connor in view of Satran. This claim contains a subset of elements found in claim 12 and is rejected using the same arguments as above.

25. Claims 9-10 are rejected as being obvious over Connor in view of Gentry and Bennet. These claims contain a subset of elements found in claim 12 and are rejected using the same arguments as above.

26. Claims 15-28 differ from claims 1-3, 6, 7, 9, 10, and 12-14 only in statutory category, containing substantially the same limitations. Therefore the same arguments used.

27. Further regarding claims 25-28, the examiner asserts in addition to the systems disclosed by the references cited above, hardware implementations of handling interrupts in network adaptors are well known in the art. Bennett further mentions the motivation for this approach would be to alleviate the need for the main computer processor to handle multiple interrupts (column 1, lines 60-63).

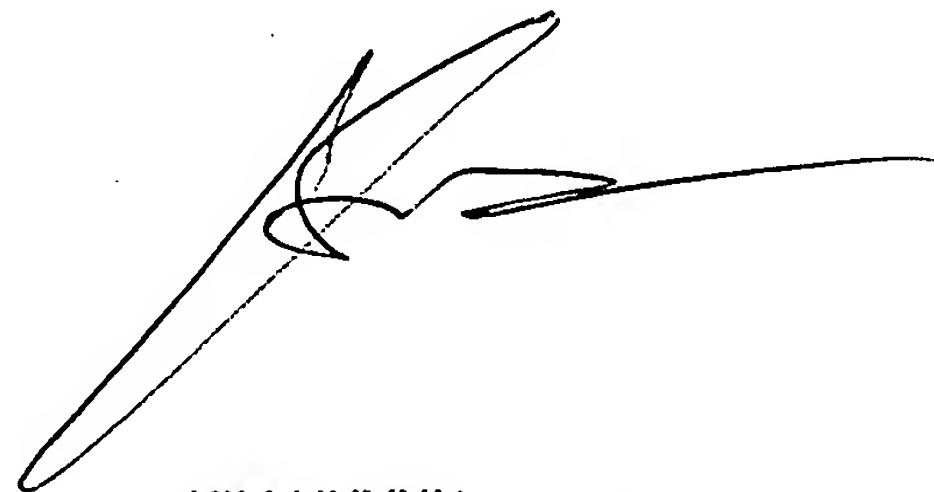
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Sun whose telephone number is (571) 272-2675. The examiner can normally be reached on M-F, 10:30am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS



KIM HUYNH  
SUPERVISORY PATENT EXAMINER

11/27/06